Certified Level 1 Validation Report, Part A: Validator Provided Details

Validator Provided

Audit Information:

Water Supplier Name: Lincoln Avenue Water Company **PWS ID:** 1910063

System Type: Potable **Audit Period:** CY 2018

Utility Representation: Benjamin Bowen, Technician Jennifer Betancourt, General Manager

Validation Date: 11/4/2019 **Call Time:** 10:00 **Sufficient Supporting Documents Provided:** Yes

Validation Findings & Confirmation Statement:

Key Audit Metrics:

Data Validity Score: 62 **Data Validity Band (Level):** Band lll (51 – 70)

ILI: 0.76 **Real Loss:** 15.28 (Gal/conn/day) **Apparent Loss:** 16.13 (Gal/conn/day)

Non-revenue water as percent of cost of operating system: 3.7%%

Certification Statement by Validator:

This water loss audit report has been Level 1 validated per the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34.

All recommendations on volume derivation and Data Validity Grades were incorporated into the water audit. ☒

If not, rejected recommendations are included here.

Validator Information:

Water Audit Validator: Justin Bailey, Rubio Cañon Land and Water Association

Qualifications: Water Audit Validator Certificate issued by the CA-NV Section of the AWWA

Certified Level 1 Validation Report, Part B: Utility Provided Details

Utility Provided

Audit Information:

Water Supplier Name:	Lincoln Avenue Water Company
Water Supplier ID Number:	1910063
Water Audit Period:	CY 2018

Water Audit & Water Loss Improvement Steps:

- Asset Management software and GIS database both being implemented as of CY 2019
- WI supply meter to be volumetrically tested for accuracy annually starting in CY 2019

Certification Statement by Utility Executive:

This water loss audit report meets the requirements of California Code of Regulations Title 23, Division 2, Chapter 7 and the California Water Code Section 10608.34 and has been prepared in accordance with the method adopted by the American Water Works Association, as contained in their manual, *Water Audit and Loss Control Programs, Manual M36, Fourth Edition* and in the Free Water Audit Software version 5.

Executive Name (Print)	Executive Position	Signature	Date
_____	_____	_____	_____

Pre-Interview Notes	Lincoln Avenue is a mutual water company in the unincorporated community of northwest Altadena and serves more than 4,400 metered connections System demands are met through a balancing of water supplied by a small surface water treatment plant, (3) ground water production wells, and imported water from an MWD wholesaler, Foothill Municipal Water District. In CY 2018 4% of water supplied was imported and 96% was supplied by Lincoln's well production and water treatment facility. Preliminary information and supporting documentation necessary to perform this validation was provided 10/4/2019. Supplemental data provided and Interview conducted between 10/4/2019 and 10/28/2019. All information requests were met and all provided information was detailed and specific.	
Audit Input	**Confirmation of Input Derivation**	**Confirmation of DVG Assignment**
Volume from Own Sources (VOS)	**Supply meter profile:** Lincoln Avenue produces source water from (3) wells and (1) Surface Water Treatment Plant. Each has its own production meter that is manually read daily and reviewed monthly. **VOS Input Data Source:** Meter registers are read daily and monthly. Production reports track cumulative production throughout the year. **Comments**: 94% of water entering the system is provided by these own sources. The meters for each are tested volumetrically on an annual basis. **Confirmed input value: 2,066.050 AF**	**Percent of VOS metered:** 100% **Signal calibration frequency:** Not performed **Volumetric testing frequency:** Annual **Volumetric testing method:** McCall's Meter using pitot method and calibrated test meter **Percent of VOS tested and/or calibrated:** 3 of 4 meters; 98% of total VOS volume registered by the (3) tested meters **Comments:** The volumetric testing occurs annually and procedures are well known by staff. **Confirmed DVG: 7**
VOS Master Meter Error Adjustment	**Adjustment Basis:** Annual volumetric testing **Net Storage Change Included:** No **Comments:** Input from supporting documents provided along with tested meter accuracy adjustments calculated. **Confirmed input value: 41.447 AF**	**Supply meter read frequency:** Daily **Supply meter read method:** Manual Read only **Frequency of data review:** Monthly **Storage level monitoring frequency:** Every 2 hours **Comments:** Known meter accuracy % is applied to each recorded monthly registered volumes to produce highly accurate actual volumes produced **Confirmed DVG: 3**

Water Imported (WI)	**Import meter profile:** Lincoln Avenue imports water from a wholesale water agency – FMWD - through a single 16" metered connection that is owned and operated by FMWD. (1) 16" W10000 Series Turbo meter **WI Data Source:** Meter remote is read daily and the register is read monthly. Production reports track cumulative production throughout the year. **Comments:** Only 4% of water entering the system is provided by local MWD wholesale agency (FMWD). **Confirmed input value: 91.560 AF**	**Percent of WI metered:** 100% **Signal calibration frequency:** Unknown **Volumetric testing frequency:** Unknown **Volumetric testing method:** Unknown **Percent of WI tested and/or calibrated:** 0% **Comments:** An active meter testing (volumetric) was implemented in CY2019 by the providing wholesale water company. This will allow more accurate registered volumes and greater DVG scores in future Audit Validations. **Confirmed DVG: 3**
WI Master Meter Error Adjustment	**Adjustment Basis:** N/A **Comments:** **Confirmed input value: Left blank for lack of test data**	**Import meter read frequency:** **Import meter read method:** **Frequency of data review:** **Comments:** Left blank as not applicable **Confirmed DVG: N/A**
Water Exported (WE)	**Export meter profile:** N/A **WE Data Source:** N/A **Comments:** N/A **Confirmed input value: 0.0 AF**	**Percent of WE metered:** N/A **Signal calibration frequency:** N/A **Volumetric testing frequency:** N/A **Volumetric testing method:** N/A **Percent of WE tested and/or calibrated:** N/A **Comments:** N/A **Confirmed DVG: N/A**
WE Master Meter Error Adjustment	**Adjustment Basis: N/A** **Comments:** Left blank for lack of test data **Confirmed input value: N/A**	**Export meter read frequency:** N/A **Export meter read method:** N/A **Frequency of data review:** N/A **Comments:** None **Confirmed DVG: N/A**

Billed Metered Authorized Consumption (BMAC)	**Customer Meters & Reads Profile:** The customer base is comprised of a mix of service types; 93% single family residential, 4% multi-family residential, & 3% commercial businesses. AMR meters are currently in the process of being test deployed - **Age profile:** Meters range new to 30 years old. Accurate statistical accounting identifies 57% new to 10 years old, 35% 10 – 20 years old, and 8% 20 – 30 years old - **Reading system:** Handheld electronic and manually entered - **Read frequency:** Monthly **Billing Data Pro-rated?** Yes, in the event of meter failure. Historical billing data is utilized to best inform pro-rated billing amount. **Comments:** Includes all metered water sales of 1,953.110 AF. **Confirmed input value: 1,953.110 AF**	**Percent of customers metered:** 100% **Small meter testing policy:** Reactive meter testing based on customer requests or complaints **Number of small meters testing/year:** Unknown **Large meter testing policy:** Reactive meter testing based on customer requests or complaints **Number of large meter tested/year:** Unknown **Meter replacement policy:** Meter replacement is performed annually for failures and AMR transition, but no quantity or age is defined by policy. **Number of replacements/year:** 354 meters (8%) were replaced in 2018. 363 meters replaced in CY2017, also roughly 8%. **Billing data auditing practice:** Automated billing software w/ monthly in-house auditing and annual 3rd party auditing **Comments:** Meter testing only occurs under limited conditions, however, the quantity (8%) of new meters being consistently installed annually increases overall meter accuracy reliability as overall meter age will consistently decrease. **Confirmed DVG: 5**
Billed Unmetered Authorized Consumption (BUAC)	**Billed Unmetered Profile:** N/A **Input Derivation:** **Comments:** No estimated billing. **Confirmed input value: N/A**	**Policy for metering exemptions:** **Comments:** None. **Confirmed DVG: N/A**
Unbilled Metered Authorized Consumption (UMAC)	**Unbilled Metered Profile:** None Reported **Input Derivation:** **Comments:** No accounts of this type reported or records provided. **Confirmed input value: N/A**	**Policy for billing exemptions:** Strict policy for approval and invoicing are in place to restrict unbilled conditions. **Comments:** N/A **Confirmed DVG: N/A**

Unbilled Unmetered Authorized Consumption (UUAC)	**Unbilled Unmetered Profile:** Operational flushing and fire department use. **Input Derivation if Estimated:** Flushing volumes & frequency as well as inadvertent reservoir spillage has been roughly estimated and coincides with the historic default. **Comments: D**efault of 0.25% x WS utilized **Confirmed input value: 5.290 AF**	**Default or Adjusted Default Applied:** Default multiplier applied **Completeness of Documentation:** Only basic notes and personal recollection currently exist. **Comments:** All fire flow volumes and hydrant flushing are monitored and calculated by time and flow formulae to minimize UUAC volumes. **Confirmed DVG: 5**
Unauthorized Consumption (UC)	**Default Applied?** Yes **Input Derivation if Customized:** Default input utilized **Comments:** All suspicious activities are investigated and active efforts are built into routine patrols to guard against UC. **Confirmed input value: 5.290 AF**	**Instances and extent of UC documented:** None identified. **Comments:** Lincoln Avenue has policies and practices in place to actively identify instances of UC. However, since known instances occur so infrequently, no auditable documentation has been put in place to track and query each instance. An auditable form will be created as a recommendation of this validation for continuous documentation and future reference. **Confirmed DVG: 5**
Customer Metering Inaccuracies (CMI)	**Input Derivation: S**ee BMAC activities for meter testing and replacement practices. Meter accuracy estimated on average meter age of 12 years by Lincoln Staff. **Comments:** Very good record keeping and tracking exists, and identifies the accurate span of overall meter age. A high inaccuracy % is estimated due to lack of test data coupled with the quantity of meters aging between 10 – 30 years old The DVG grade will change in future years when more regular accuracy testing occurs. **Confirmed input value: (3.5%) 70.838 AF**	**Characterization of meter testing:** Currently, meter testing only occurs at request of customer or when billing software flags a discrepancy. **Characterization of meter replacement:** Ongoing and increasing quantity of service meters are replaced each year considering overall staff size. 354 (8%) were replaced in 2018. **Comments:** The phased introduction of AMR meters is being planned and budgeted, with active installations beginning in CY 2018 **Confirmed DVG: 3**

Systematic Data Handling Errors (SDHE)	**Input Derivation:** Computerized billing software and reporting is in place. In house audits of data occur monthly and a 3rd party auditor review takes place annually. **Comments:** Default input being utilized. **Confirmed input value: 4.883 AF**	**If custom estimate provided –** Default input utilized **Characterization of read collection & billing process:** Manual meter reads are collected and entered into computerized billing software. **Characterization of billing process and billing data auditing:** In house monthly and 3rd party annually. **Confirmed DVG: 5**
Length of Mains	**Input Derivation:** As-built data and updated paper system maps **Hydrant lateral length included:** No **Comments:** Base maps and AS-Builts are cross referenced for accuracy. Sound policies exist for updating by Lincoln Avenue staff. **Confirmed input value: 58.0 Miles**	**Mapping format:** Paper system maps + As-Built data **Asset management database:** Primarily for accounting purposes. GIS project is underway in CY 2019 (Next Audit Reporting year) **Map updates & field validation:** Map updates take place following each project and are performed under the direct supervision of the Lincoln Avenue General Manager. **Comments:** GIS was budgeted during this CY 2018 Audit year, and began implementation in CY 2019. Will be reflected in future Audits / Validations. **Confirmed DVG: 6**
Number of Active and Inactive Service Connections	**Input Derivation:** Billing software is used to query accurate record of accounts. **Basis for database query:** Account ID or Parcel ID **Comments:** Service area is effectively 'built out' with only small quantities of account activations or deactivations occurring annually. **Confirmed input value: 4,484**	**CIS updates & field validation:** Accomplished through normal meter reading process **Estimated error of total count within:** Within 2% reported by LAWCo. Staff **Comments:** Infrequency of Account activation or deactivation combined with long standing procedures and computerized accounting software produces highly reliable results. Auditing of electronic records takes place by a 3rd party annually. **Confirmed DVG: 8**

Average Length of Customer Service Line	**Are customer meters at the curbstop?** Yes **Where are customer meters installed if not at curbstop? N/A** **Customer service line derivation** **Comments:** Default input grade applied. Customer meters are typically located at the property boundary. **Confirmed input value: YES**	**Comments:** Default input grade applied. Customer meters are typically located at the property boundary. **Confirmed DVG: 10**
Average Operating Pressure	**Number of zones, general setup:** The system has 6 pressure zones, fed by the combination of 3 wells, a surface water treatment plant, and imported water from an MWD wholesaler. **Typical pressure range:** 20 – 120 psi in general. 92 psi average across all pressure zones. **Input derivation:** SCADA telemetry (real-time only), facility elevations, and physically monitored system pressure gauges **Comments:** Pressure zone integrity is tightly monitored and no valves are left in a position to breech pressure zones. **Confirmed input value: 92 psi**	**Extent of static pressure data collection:** SCADA does not currently maintain historical records of system pressures. **Characterization of real-time pressure data collection:** SCADA telemetry records real time system pressures at all pumping facilities. **Hydraulic model in place?** No **Calibrated?:** N/A **Comments:** Hydrant pressures are also recorded during testing / fire flows to further document static system pressures **Confirmed DVG: 3**
Total Operating Cost (TOC)	**Input Derivation:** From internal budgeting reports. See provided "LAWC 2018 Financial Statement" Distribution ($2,723,087), General ($568,910), Administrative ($757,518), Depreciation ($595,740) = $4,645,255 annual cost CY 2018 **Comments:** From Lincoln Avenue Water Co. budget documents and cost auditing. **Confirmed input value: $4,645,255 / Year**	**Frequency of internal auditing:** Monthly **Frequency of third-party CPA auditing:** Annually **Comments:** Cost accounting system is in place with monthly internal review and annual audit of data. **Confirmed DVG: 10**

Customer Retail Unit Cost (CRUC)	**Input Derivation:** Internal balancing of tiered rate structure **Sewer Charges Volumetric?** N/A **Sewer Charges Included?** N/A **Comments:** Tiered rate structure in place and confirmed costs limited to water only. **Confirmed input value: $4.08 / 100 Cubic Feet**	**Characterization of calculation:** Average of tiered rates. All Customer Classes pay same rate. Input calculations have not been reviewed by an M36 water loss expert. Volumes metered per Customer Class: • Commercial: 3% • Multi-Dwelling: 4% • Residential: 93% **Comments:** 4-Tier rate structure implemented in 2010 and is revised annually; 5/2017 and 2018. **Confirmed DVG: 8**
Variable Production Cost (VPC)	**Supply profile:** 96% VOS + 4% Water Imported from MWD wholesaler (FMWD) **Direct variable costs included:** Gaseous chlorine, supply and distribution power, and purchase costs as provided; FMWD (WI): $92,974 + Water lease exp (less JPL reimbursement): $291,000 + Power: $392,067 = $776,041 ÷ "Adjusted" Production: 2,116.163 AF = $366.72 / AF **Secondary costs included:** No **Comments:** Cost accounting system in place with well trained staff administering and annual internal + annual 3rd party CPA audits. **Confirmed input value: $366.72 / AF**	**Characterization of calculation:** Primary costs plus some secondary costs. **Comments:** Although variable costs are well known and tracked, the input calculations do not include liability and depreciation and are not reviewed by an M36 water loss expert. **Confirmed DVG: 5**
Pending Items needed to complete the validation	None	